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A COMPARATIVE STUDY ON NUTRITIONAL STATUS OF DAY SCHOLAR AND HOSTELLER ADOLESCENT BOYS WITH INTELLECTUAL DISABILITY

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ABSTRACT

The present study was designed to assess the nutritional status of day scholar and hosteller adolescent boys with intellectual disabilities with the objective to assess the anthropometric measurement, hemoglobin parameter and also nutrient intake. Total 60 subjects were randomly selected, out of which 30 were day scholars from National Association for Integration and Rehabilitation of the Handicapped (NAIRH) and 30 were hostellers from Educational cum Vocational Association for Disabled (EVAD) of Faridabad. Questionnaire was developed including general information, intelligence quotient, 24 hour dietary recall method and data was collected by interviewing the subjects. The study revealed that 20% hostellers were underweight and 66% were overweight in comparison to 10% underweight day scholars and 3.3% were overweight day scholar. Consumption of all nutrients by majority of the boys was comparatively less than recommended dietary allowances. On comparing the dietary intake of hostellers and day scholars there was a significant difference at level $p < 0.05$ in energy, fats, carbohydrate and iron intake. Dietary data indicated that 90% of day scholars were consuming salad and no salad consumption pattern was seen among hostellers. Study also reported regular physical exercise pattern for 1-2 hours which was followed by both hosteller and day scholars. Association between hemoglobin level and intelligence quotient of day scholar and hosteller was found to be significant at $p < 0.05$. A positive correlation was observed when body mass index and intellectual disability of day scholars and hostellers were compared. Study concluded that those who are highly intellectually disabled are highly malnourished.

Keywords: Nutritional, Intellectual, Rehabilitation, Handicapped, Quotient.

INTRODUCTION

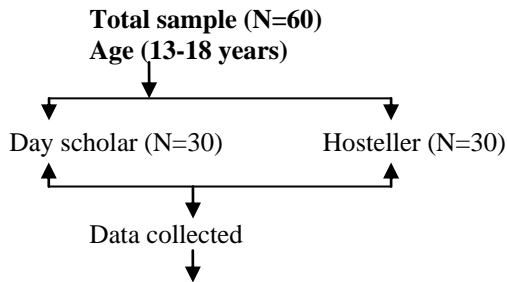
The consequences of malnutrition among school age children includes stunted growth, underweight, anemia, iodine deficiency and other health related problems such as malaria, diarrhea, worm and respiratory infection Intellectual disability (ID), is called mental retardation, is characterized by below-average intelligence or mental ability and a lack of skills necessary for day-to-day living. People with intellectual disabilities can and do learn new skills, but they learn them more slowly. IQ (intelligence quotient) is measured by an IQ test. The average IQ is 100. A person is considered intellectually disabled if he or she has an IQ of less than 70 to 75. Mental retardation can cause many problems

- Respiratory illness
- Vision impairment

- Hearing impairment
- Oral health problems
- Nutrition problems
- Constipation
- Thyroid disease
- Obesity and poor physical fitness
- A person is considered intellectually disabled if he or she has an IQ of less than 70 to 75.
- A mild intellectual disability is defined as an IQ between 50 and 70.
- A moderate intellectual disability is defined as an IQ between 35 and 50.
- A severe intellectual disability is defined as an IQ between 20 and 35.

MATERIALS AND METHODS

Selection and categorization of subjects



- Demographic profile of subjects
- Distribution of subjects on the basis of intelligence quotient
- Nutritional assessment of the subjects
- Lifestyle pattern of the subjects

- Development of tools and techniques --Questionnaires for the collection of general information, dietary pattern, socio economic status.
- Questionnaire was developed and data was gathered by interviewing the subjects
- Anthropometric measurements were taken which includes height, weight, mid upper arm circumference (MUAC), waist- hip ratio.
- Hemoglobin parameters were checked
- Clinical signs and symptoms were noticed.
- 3day 24 hr recall method was used for gathering information about the dietary pattern of the subject for whole day.

RESULTS AND DISCUSSION

The result of the present study is discussed under the following heading.

Table 1- Anthropometric measurement of day scholars and hostellers

| Anthropometric Measures | Day scholars N=30 | | Hostellers N=30 | | t-test | |
|--------------------------|-------------------|----------------|-----------------|--------------|---------------------|---------------------|
| | 13-15yr (N=12) | 16-18yr (N=18) | 13-15yr (N=23) | 16-18yr(N=7) | 13-15 years | 16-18 years |
| Height(Cm) | 144.5±9.02 | 148.5±14.05 | 144.26±9.43 | 139.42±13.7 | 0.073 ^{NS} | 1.47 ^{NS} |
| Weight(Kg) | 41.6±11.27 | 45.33±15.49 | 37.30±11.41 | 37.31±9.91 | 1.2 ^{NS} | 1.53 ^{NS} |
| Bmi(Kg/ M ²) | 19.8±4.69 | 20.19±4.64 | 17.99±4.33 | 18.97±3.10 | 1.11 ^{NS} | 1.41 ^{NS} |
| Muac(Cm) | 22.16±3.76 | 30.63±22.45 | 22.06±4.10 | 25.14±5.61 | 0.72 ^{NS} | 2.665 ^{NS} |
| Waist/Hip Ratio | 0.930±0.05 | 0.908±0.056 | 0.84±0.113 | 0.89±0.166 | 4.5* | 2.85* |
| Head Circumference (cm) | 52.5±2.23 | 52.33±1.97 | 50.65±2.85 | 51.71±1.79 | 2.11 ^{NS} | 0.75 ^{NS} |

NS- non significant

*P < 0.05.

The above table reveals the anthropometric measurement of subjects. Mean height of day scholar and hosteller in the age group of 13-15 years was found to be 144.5 cm and 144.2 cm respectively which was proved to be non significant at P < 0.05. Similarly, no significant difference was observed between mean height of day scholar and hosteller in the age group of 16-18 years. The mean weight in the age group of 13-15 years of day scholars and hostellers was found to be 41.6 kg and 37.30 kg which show non significance at p < 0.05. The B.M.I of day scholars and hosteller was 19.8 kg/m² and 17.99 kg/m² in the age group of 14-15 years. Similarly, in the age group of 16-18years the mean B.M.I of day scholars and hostellers was 20.19 and 18.97 kg/m² respectively. The present study shows that mean MUAC of day scholars and hostellers in the age group of 13-15 years was 22.16 and 22.06 cm which was proved to be non significant at level of 0.05. There was a significant difference in the waist/hip ratio of 13-15and 16-18 years of day scholars and hostellers. The mean of waist/hip ratio of day scholars and hostellers in the age group 13-15 years was 0.93 and 0.84 in comparison to the age group of 16-18 years it was 0.90 cm and 0.89 cm. The head circumference of adolescent day scholars and hosteller boys in the age of 13-15 and 16-18

was 52.5, 50.65 and 52.33, 51.72 cm respectively and there was no significant difference. This table concludes that adolescents were having higher waist to hip ratio in the age group of 13-15 years as compared to 16-18 years.

Table 2 -Distribution of subjects on the basis of BMI categorization according to CDC growth charts

| BMI | Day scholars | Hostellers | Total |
|------------------------------|--------------|------------|-----------|
| Underweight (1-5 Percentile) | 3(10) | 6(20) | 9(15) |
| Normal (5-85 Percentile) | 25(83) | 22(73.3) | 47 (78.3) |
| Overweight (85-95percentile) | 1(3.3) | 2(6.6) | 3(5) |
| Obese (95-100percentile) | 1(3.3) | 0(0) | 1(1.6) |

The values in parenthesis are in percentage (%)

The table concludes that 83% of day scholars were within the normal range of B.M.I i.e. 5-85 percentile on the other hand this decreases to 73.3% in hostellers. 3.3 % of day scholars and 6.6% of hostellers were categorized as overweight and obese i.e. 85-95 percentile and above 95

percentile. These results are in concordance with the studies by Mathur M (2007) who assessed the dietary habits and nutritional status in mentally retarded children and adolescents. More mentally retarded children were underweight, while more normal children were

overweight. These results are in concordance with the studies by Nanzi *et.al.*, (2011) who assessed the nutritional status and academic performance in school childrens.

Table 3- Distribution of subjects on the basis of intelligence quotient

| Intelligence Quotient | Day scholars | Hostellers | Total |
|-----------------------|--------------|------------|-----------|
| Mild(50-69) | 19(63.3) | 18(60) | 37(61.66) |
| Moderate(35-49) | 6(20) | 7(23.33) | 13(21.66) |
| Severe Below 35 | 5(16.6) | 5(16.66) | 10(16.66) |

The values in parenthesis are in percentage (%) Table shows that 63.3% day scholars were mild intellectually disabled as compared to hostellers it was 60%. On the other hand 23.33% hostellers were having moderate intelligence quotient in comparison to day scholars it decreases to 20% while 16.66% of day scholar and 16.66% hosteller were in the severe category of intelligence quotient.

There was a positive co-relation between B.M.I and intelligence quotient of day scholars and hostellers.

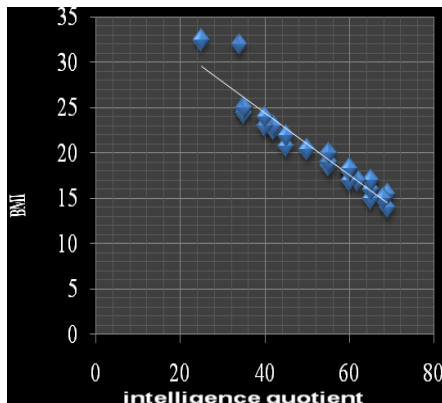


Figure No.1 Correlation between intelligence quotient and body mass index (BMI) of day scholars

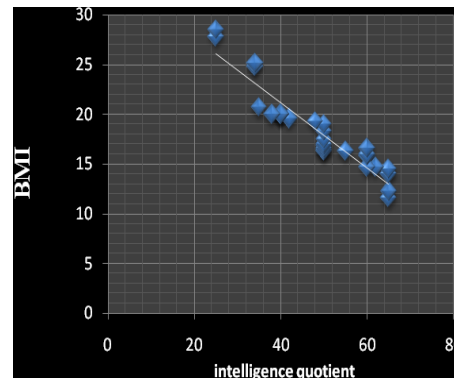


Figure No.2 Correlation between intelligence quotient and body mass index (BMI) of hostellers

There is a positive correlation between intellectual disability and BMI of hosteller and day scholars.

ENERGY

Energy: It is seen from above data that intake of energy is more in day scholars as compared to hostellers It is observed from the data that intake of energy as energy heading is formatted above the table) Whereas the adolescents of age group of 16-18 years consume more energy as compared to the age group of 13-15 years (2209kcal and 1980 respectively). This shows that the requirement of energy increases with age and which was significantly proved at $p < 0.05$

Table 4- Mean Nutrient intake of subjects (omit of between mean nutrient)

| Age group | Recommended Dietary Allowance | | Day Scholars N=30 | | Hostellers N=30 | | T-Test | |
|-------------------|-------------------------------|-------------|-------------------|------------------|------------------|-----------------|-------------|-------------|
| | 13-15 Years | 16-18 Years | 13-15 Years N=12 | 16-18 Years N=18 | 13-15 Years N=23 | 16-18 Years N=7 | 13-15 Years | 16-18 Years |
| Energy (kcal/day) | 2750 | 3020 | 1980±220.53 | 2209.5±153.006 | 1545.25±347.49 | 1596.42±253.14 | 4.50* | 5.9* |
| Protein (gm) | 54.3 | 61.5 | 43.8±8.8 | 39.76±11.39 | 54.88±6.51 | 55.39±8.66 | 3.84* | 3.69* |
| Fat (gm) | 45 | 50 | 58.73±15.08 | 56.64±6.75 | 45.1±9.33 | 44.05±11.39 | 2.5 * | 2.7* |
| Carbohydrate (gm) | 412.5 | 453 | 302.68±38.35 | 263.89±57.13 | 253.21±53.49 | 182.46±32.10 | 3.14 * | 4.4 * |
| Iron (mg) | 32 | 28 | 14.55±1.94 | 15.18±2.3 | 10.93±2.41 | 10.64±2.45 | 4.82* | 3.94* |

NS- non significant
*P < 0.05.

PROTEIN

It is observed from the above table that the protein consumption is less in day scholars as compared to hostellers as hostellers were taking milk in the diets as a part of their daily menu. This shows that the consumption is more in the age group of 16-18 years in both day scholars and hostellers (This shows that the consumption is more in the age group of 16-18 years hostellers).

FAT

The consumption of fat was higher in day scholars as compared to hostellers. It is seen that as the requirement of fat increases with age the intake of fat also increases as the age increases and proved at level $p < 0.05$.

CARBOHYDRATE

It was observed that the consumption of carbohydrate was more in day scholars i.e 302.6 ± 38.3 and in hostellers it was 253.2 ± 53.4 . Considering the age group it was more in the age group of 13-15 years which is proved significant at $p < 0.05$.

IRON

It was observed that the consumption of iron is less as per the requirement of iron. There was a significant difference in the daily mean intake of iron in both the age group. but it was found that day scholars were consuming higher content of iron in their diet as compared to hostellers which was proved significant at $p < 0.05$. This result is related to studies conducted by Saroja Prabhakaran (2003) and Nazni *et.al.*, 2011 conducted study on nutritional status of 300 adolescents (13-16 years) in four villages of sevagram. The results revealed that the prevalence of severe, moderate and mild anaemia was 0.6 per cent (< 7 g/dl), 20.8 per cent (7.10 g/dl) and 38.4 percent (10-12 g/dl) respectively and another study conducted by Kumar *et al.* (2006) conducted a study on influence of family's vegetable cultivation on prevalence of anaemia among 80 adolescent girls in Allahabad and results showed that intake of all the nutrients were comparatively less than the recommended dietary allowance except for fat.

CONCLUSION

The present study concluded that nutritional status of day scholar adolescent boys with intellectual disability was better in comparison to hosteller and it was observed through BMI and mean nutrient intake. Nutritional status depicts that majority of day scholars and hostellers were malnourished Iron content was low in the dietary intake of hostellers and day scholars which shows a significance at $p < 0.05$. Significant result was observed when I.Q and hemoglobin was compared in both residing condition i.e. hosteller and day scholars.

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